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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TIES VAN BOMMEL and NICOLAAS PETRUS WILLARD

Appeal 2011-004344
Application 10/596,920
Technology Center 1600

Before TONI R. SCHEINER, DONALD E. ADAMS, and
JEFFREY N. FREDMAN, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 15-33. We have jurisdiction under 35 U.S.C. § 6(b).

STATEMENT OF THE CASE

The claims are directed to a method of diagnosis (claims 15 and 17-30) and a method of imaging an isolated tissue sample or organ (claims 16 and 31-33). Claims 15 and 16 are representative and are reproduced in the "CLAIMS APPENDIX" of Appellants' Brief (App. Br. 12).

Claims 15-29, 32, and 33 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Hainfeld I[1] and West.[2]

Claims 15-23, 25-28, 32, and 33 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Bekeredjian.[3]

Claims 15-33 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Hainfeld I, West, and Hainfeld II.[4]

We reverse the rejection over Bekeredjian and affirm all other grounds of rejection.

The rejections over Hainfeld I and West with or without Hainfeld II:

ISSUE

Does the preponderance of evidence on this record support a conclusion of obviousness?

FACTUAL FINDINGS (FF)

FF 1. Appellants' Specification discloses that "[t]he metal nano-particles according to the present invention have a diameter of between 1-100 nm" and "have an acoustical impedance of at least $35x10^5$ g/cm^{2}s" (Spec. 4: 12-13 and 5: 3-5).

FF 2. Appellants' Specification discloses that gold and rhenium are examples of a metal with an "acoustical impedance which is appropriate in the context of . . . [Appellants'] invention" (*id.* at 5: 8-10).

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[1] Hainfeld et al., US 6,818,199 B1, issued November 16, 2004.
[2] West et al., US 2002/0103517 A1, published August 1, 2002.
[3] Raffi Bekeredjian et al., *POTENTIAL OF GOLD-BOUND MICROTUBULES AS A NEW ULTRASOUND CONTRAST AGENT*, 28(5) ULTRASOUND IN MED. & BIOL. 691-695 (2002).
[4] Hainfeld et al., US 2005/0020869 A1, published January 27, 2005.

FF 3. Hainfeld I suggests the use of metal, such as gold, nanoparticles ranging from 0.5 to 500 nm in size as a contrast agent for, *inter alia*, ultrasound (Ans. 4-6).

FF 4. Hainfeld I suggests that "[o]nes skilled in the art will be familiar with the use of sources other than x-rays to produce detection or imaging of metal particles" (Hainfeld, col. 19, ll. 22-24).

FF 5. Examiner finds that "Hainfeld [I] does not specifically recite in vitro imaging" (Ans. 7).

FF 6. West suggests a method of localized imaging of biological materials that comprises "delivering [gold] nanoparticles to the cell or tissue and exposing said nanoparticles to . . . ultrasound" (*id.*; *see also* West 3: ¶ [0025]).

FF 7. Hainfeld II suggests the use of rhenium nanoparticles of 0.5 to 400 nm to enhance the effects of radiation (*id.* at 9).

FF 8. Hainfeld II suggests that the "forms of energy suitable for use in practicing the methods of . . . [Hainfeld II's] invention include . . . ultrasound" (Hainfeld II 10: ¶ [0116]; Ans. 9).

ANALYSIS

Based on the combination of Hainfeld I and West, Examiner concludes that at the time of Appellants' claimed invention it would have been prima facie obvious to a person of ordinary skill in this art "to use the particles of Hainfeld [I] for in vitro imaging of cells and tissues in order to expand the applications for which the particles are useful" (Ans. 7).

Claim 15:

Appellants contend that Hainfeld I "is totally focused on exploiting the electromagnetic absorption properties of its metal nano-particles" and that "[t]here is no mention [in Hainfeld I] of any form of high-contrast acoustic imaging, or of selecting and employing nano-particles that would have good properties for high-contrast acoustic imaging, or that solid metal nano-particles having an acoustic impedance above $35x10^5$ g/cm^2s could or should be effectively employed for high-contrast acoustic imaging" (App. Br. 5; *see also* Reply Br. 2-3). We are not persuaded (FF 1-4).

We are also not persuaded by Appellants' unsupported contention that Hainfeld I "does not enable receiving ultrasound wave reflections produced by an ultrasonic sound wave in an animal or human subject" (App. Br. 6; Reply Br. 3-4; *Cf.* FF 3-4). *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) (Argument by counsel cannot take the place of evidence).

We recognize, but are not persuaded by, Appellants' contention that West alone does not suggest "that the imaging is performed from ultrasound reflections" (App. Br. 6 (emphasis removed); *see also* Reply Br. 4). West is applied in combination with Hainfeld I. When viewed in combination the references suggest imaging by ultrasound with the aid of a solid metal nanoparticle contrast agent according to methods known by those of ordinary skill in this art at the time the invention was made (*see* FF 4 (Hainfeld I suggests that "[o]nes skilled in the art will be familiar with the use of sources other than x-rays to produce detection or imaging of metal particles"); *see also* FF 3, 6-8).

With regard to the combination of Hainfeld I, West, and Hainfeld II, Appellants "traverse the rejection of claim 15 . . . for the same reasons as set

forth above" (App. Br. 9). We are not persuaded for the reasons set forth above.

In sum, Appellants fail to establish, through a preponderance of evidence on this record, that a person of ordinary skill in this art practicing the method suggested by the combination of Hainfeld I and West (and Hainfeld II as it relates to rhenium nanoparticles) using (1) nanoparticles that intrinsically have the same property required by Appellants' claimed invention (*see* FF 1-3 and 7) and (2) means familiar to those of ordinary skill in this art (*see* FF 4; *see also* FF 3, 6, and 8) would not receive sound wave reflections produced by the ultrasonic wave in the animal or human subject, including ultrasound sound wave reflections from the nanoparticles (*Cf.* App. Br. 6 ("receiving ultrasound sound wave reflections produced by an ultrasonic wave in an animal or human subject, including ultrasound sound wave reflections from solid metal nano-particles having an acoustic impedance of above $35x10^5$ g/cm^2s, is not taught by, or inherent in Hainfeld and/or West")).

Claim 16:

Appellants contend that the combination of Hainfeld I and West fails to suggest the subject matter of claim 16 (App. Br. 7; Reply Br. 4-5). We are not persuaded for the reasons set forth above (*see also* Ans. 7 (at the time of Appellants' claimed invention, it would have been prima facie obvious to a person of ordinary skill in this art "to use the particles of Hainfeld for in vitro imaging of cells and tissues in order to expand the applications for which the particles are useful")).

With regard to the combination of Hainfeld I, West, and Hainfeld II, Appellants rely on their arguments "set forth above with respect to claim 15" (App. Br. 9-10). We are not persuaded for the reasons set forth above.

CONCLUSION OF LAW

The preponderance of evidence on this record supports a conclusion of obviousness.

The rejection of claims 15 and 16 under 35 U.S.C. § 103(a) as unpatentable over the combination of Hainfeld I and West is affirmed. Because they are not separately argued claims 17-29 fall together with claim 15 and claims 32-33 fall together with claim 16. 37 C.F.R. § 41.37(c)(1)(vii).

The rejection of claims 15 and 16 under 35 U.S.C. § 103(a) as unpatentable over the combination of Hainfeld I, West, and Hainfeld II is affirmed. Because they are not separately argued claims claims 17-30 fall together with claim 15 and claims 31-33 fall together with claim 16. 37 C.F.R. § 41.37(c)(1)(vii).

The rejection over Bekeredjian:

ISSUE

Does the preponderance of evidence on this record support a conclusion of obviousness?

FACTUAL FINDINGS (FF)

FF 9. Bekeredjian suggests the use of gold colloids, having a mean particle diameter of 10 nm and immobilized on protein microtubule walls, as an ultrasound contrast agent (Ans. 8 and 13; *see also* Bekeredjian, 691: Abstract and 692: col. 1, ll. 22-23).

ANALYSIS

Examiner failed to establish a factual basis on this record to support a conclusion that gold *colloids* immobilized on protein microtubule walls are, or reasonably suggest, *solid metal nanoparticles* having an acoustic impedance above $35x10^5$ g/cm^2s as is required by Appellants' claimed invention (*see* Reply Br. 5-6; *Cf.* FF 9).

CONCLUSION OF LAW

The preponderance of evidence on this record fails to support a conclusion of obviousness. The rejection of claims 15-23, 25-28, 32, and 33 under 35 U.S.C. § 103(a) as unpatentable over Bekeredjian is reversed.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

cdc